IN THE CLAIMS

Please amend the claims as follows:

1-34 (Canceled)

35 (Previously Presented): A projection-optical-system adjusting method with which to adjust a projection optical system used in an exposure apparatus, said adjusting method comprising:

obtaining information on a wave-front aberration of a projection optical system whose specification is determined with using one of a wave-front aberration amount and a value corresponding to a wave-front aberration as a standard; and

adjusting said projection optical system based on said obtained information on a wave-front aberration and Zernike Sensitivity corresponding to exposure conditions for an object.

36 (Original): A projection-optical-system adjusting method according to claim 35, wherein, in said adjusting, said projection optical system is adjusted such that the coefficient of a specific term selected, based on target information, from coefficients of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded is not over a given limit.

37 (Original): A projection-optical-system adjusting method according to claim 35, wherein, in said adjusting, said projection optical system is adjusted such that the RMS value of coefficients of terms of a Zernike polynomial in which said wave-front within the entire field of said projection optical system is expanded is not over a given limit.

38 (Original): A projection-optical-system adjusting method according to claim 35, wherein, in said adjusting, said projection optical system is adjusted such that the coefficients of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded are not over given respective limits.

39 (Original): A projection-optical-system adjusting method according to claim 35, wherein, in said adjusting, said projection optical system is adjusted such that the RMS value, within the field of said projection optical system, of coefficients of n'th order, $m\theta$ terms corresponding to a watched, specific aberration out of coefficients of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded is not over a given limit.

40 (Original): A projection-optical-system adjusting method according to claim 35, wherein, in said adjusting, said projection optical system is adjusted such that the RMS value, within the field of said projection optical system, of coefficients of each group of $m\theta$ terms having the same $m\theta$ value out of terms, which correspond to a watched, specific aberration, out of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded is not over a given respective limit.

41 (Original): A projection-optical-system adjusting method according to claim 35, further comprising:

obtaining information of a pattern subject to projection in said projection optical system,

wherein, in said adjusting, said projection optical system is adjusted based on a space image of said pattern calculated based on linear combinations between sensitivities, to

a watched aberration, of coefficients of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded and the coefficients of terms of a Zernike polynomial in which a wave-front measured in said projection optical system is expanded, such that said watched aberration is not over a limit, said sensitivities depending on said pattern.

42 (Previously Presented): A projection-optical-system adjusting method according to claim 35, further comprising:

obtaining target information that said exposure apparatus is to achieve,

wherein, in said adjusting, said projection optical system is adjusted such that the RMS value of coefficients given by weighting according to said target information the coefficients of terms of a Zernike polynomial in which a wave-front in said projection optical system is expanded is not over a given limit.

43 (Original): A projection-optical-system adjusting method according to claim 42, wherein said target information includes information of a pattern subject to projection by said projection optical system.

44 (Previously Presented): A projection-optical-system adjusting method according to claim 35, wherein in measuring said wave-front, a wave-front in said projection optical system is measured based on a result of printing a given pattern on a substrate via a pinhole and said projection optical system.

45 (Original): A projection-optical-system adjusting method according to claim 35, wherein in measuring said wave-front, a wave-front in said projection optical system is measured based on a space image formed via a pinhole and said projection optical system.

46-84 (Canceled)

85 (Previously Presented): A projection-optical-system adjusting method according to claim 35, wherein based on said obtained information on a wave-front aberration and said Zernike Sensitivity, adjustment information of said projection optical system is calculated using the least-squares method in order to adjust said projection optical system based on the adjustment information.

86 (Previously Presented): A projection-optical-system adjusting method according to claim 85, wherein based on data regarding a relation between an adjustment amount of an optical element of said projection optical system and variation of coefficients of terms of a Zernike polynomial, the adjustment amount of the optical element of said projection optical system is calculated as said adjustment information.

87 (Previously Presented): A projection-optical-system adjusting method according to claim 86, wherein coefficients of terms of a Zernike polynomial are determined by measuring a wave-front aberration of said projection optical system, and in calculation of said adjustment amount said determined coefficients of terms of a Zenike polynomial are used.

88 (Previously Presented): A projection-optical-system adjusting method according to claim 87, wherein an adjustment amount of said optical element is calculated such that an

error of an image of a pattern is not over a given limit at each of a plurality of points in a predetermined area where the pattern is projected, within a field of said projection optical system.

89 (Previously Presented): A projection-optical-system adjusting method according to claim 88, wherein said exposure conditions includes at least an illumination condition for a pattern to be transferred on said object.

90 (Previously Presented): A projection-optical-system adjusting method according to claim 35, wherein

said adjustment of said projection optical system is performed before said projection optical system is installed in said exposure apparatus, and

in said adjustment before the installation, at least one of reprocessing, replacement and position adjustment of an optical element of said projection optical system is performed.

91 (Previously Presented): A projection-optical-system adjusting method according to claim 35, wherein

measurement of information on said wave-front aberration and said adjustment of said projection optical system are performed after said projection optical system is installed in said exposure apparatus, and

in said adjustment after the installation, position adjustment of an optical element of said projection optical system is performed.

92 (Previously Presented): A projection-optical-system adjusting method according to claim 91, wherein

said adjustment of said projection optical system is performed before said projection optical system is installed in said exposure apparatus, and

in said adjustment before the installation, at least one of reprocessing, replacement and position adjustment of an optical element of said projection optical system is performed.

93 (Previously Presented): An exposure method with which to transfer a pattern onto an object via a projection optical system, said method comprising:

adjusting said projection optical system using the projection-optical-system adjusting method according to claim 91; and

forming an image of said pattern on said object via said adjusted projection optical system.

94 (Previously Presented): An exposure method according to claim 93, wherein based on said obtained information on a wave-front aberration and said Zernike Sensitivity, adjustment information of said projection optical system is calculated using the least-squares method in order to adjust said projection optical system based on the adjustment information.

95 (Previously Presented): An exposure method according to claim 94, wherein based on data regarding a relation between an adjustment amount of an optical element of said projection optical system and variation of coefficients of terms of a Zernike polynomial, the adjustment amount of the optical element of said projection optical system is calculated as said adjustment information.

96 (Previously Presented): An exposure apparatus that transfers a pattern onto an object, said exposure apparatus comprising:

a projection optical system which has a plurality of optical elements to form an image of said pattern on said object, and a specification of which is determined with using one of a wave-front aberration amount and a value corresponding to a wave-front aberration, as a standard; and

an adjusting unit which includes an actuator provided in said projection optical system, and adjusts said projection optical system based on information on a wave-front aberration of said projection optical system and Zernike Sensitivity corresponding to exposure conditions for said object.

97 (Previously Presented) An exposure apparatus according to claim 96, wherein said adjusting unit calculates adjustment information of said projection optical system using the least-squares method, based on said information on a wave-front aberration and said Zenike Sensitivity, and controls said actuator based on the adjustment information.

98 (Previously Presented): An exposure apparatus according to claim 97, wherein said adjusting unit calculates an adjustment amount of an optical element of said projection optical system as said adjustment information, based on data regarding a relation between the adjustment amount of the optical element of said projection optical system and variation of coefficients of terms of a Zernike polynomial.

99 (Previously Presented): An exposure apparatus according to claim 98, further comprising:

a measuring unit at least a part of which is disposed on a side of an image plane with respect to said projection optical system in order to measure a wave-front aberration of said projection optical system; and wherein

said adjusting unit determines coefficients of terms of a Zernike polynomial from said measured wave-front aberration, and

in calculation of said adjustment amount, said determined coefficients of terms of a Zernike polynomial are used.

100 (Previously Presented): An exposure apparatus according to claim 99, wherein an adjustment amount of said optical element is calculated such that an error of an image of a pattern is not over a given limit at each of a plurality of points in a predetermined area where the pattern is projected, within a field of said projection optical system.

101 (Previously Presented): An exposure apparatus according to claim 100, wherein said exposure conditions includes at least an illumination condition for a pattern to be transferred onto said object.

102 (Previously Presented): An exposure apparatus according to claim 96, wherein

a wave-front aberration of said projection optical system is measured before said projection optical system is installed in said exposure apparatus, and

based on the measured wave-front aberration, at least one of reprocessing, replacement and position adjustment of an optical element of said projection optical system is performed.